Statement of Kevin M. Kolevar
Assistant Secretary for Electricity Delivery & Energy Reliability
U.S. Department of Energy
FY 2009 Appropriations Hearing

Senate Committee on Appropriations
Subcommittee on Energy and Water Development
March 5, 2008

Mr. Chairman and members of the Committee, thank you for this opportunity to testify on the President's Fiscal Year (FY) 2009 budget request for the Office of Electricity Delivery and Energy Reliability.

The mission of the Office of Electricity Delivery and Energy Reliability (OE) is to lead national efforts to modernize the electricity delivery system, enhance the security and reliability of America's energy infrastructure, and facilitate recovery from disruptions to energy supply. These functions are vital to the Department of Energy's (DOE) strategic goal of protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally responsible energy.

The President's FY 2009 budget includes $134 million for OE in FY 2009, which is almost a 17% increase from the FY 2008 request. This includes $100.2 million for Research and Development activities, $14.1 million for Operations and Analysis activities, and $19.7 million for Program Direction. My testimony on the Administration's FY 2009 budget request reflects a comparison to the Administration's FY 2008 budget request.

Today, the availability and access to electricity is something that most Americans take for granted. Most people cannot describe what it is or where it comes from. Yet, it is vital to nearly every aspect of our lives from powering our electronics and heating our homes to supporting transportation, finance, food and water systems, and national security.

The Energy Information Administration has estimated that by the year 2030, U.S. electricity consumption will be almost 35% higher than it was in 2009. This indicates a growing economy, but it also promises a significant amount of new demand on the electricity infrastructure- an infrastructure that is already stressed and aging. This means that we need to focus our attention on reliability.

Climate change is also affecting electric industry investments. The uncertainty in climate change legislation and policies is limiting investment in generation from fossil fuels and is stimulating investment in renewables such as wind. However intermittent resources such as renewables require energy storage or other balancing technologies, advanced communications and sophisticated modeling to maximize penetration without affecting the reliability and efficiency of our electric system.

One of the Department's strategies for reducing our dependence on foreign oil is increased electrification by transitioning to electric vehicles also known as plug-in hybrids. Plug-in hybrids could provide a great opportunity if we begin now to enable smart grid features such as enhanced intelligence and control.

Title 13 and section 641 of the Energy Security and Independence Act of 2007 highlights the need for the development of a modernized grid. Title 13 addresses the need for a Smart Grid, which is a transmission and distribution network modernized with the latest digital and information technologies for enhanced operational monitoring, control, and intelligence.

OE's FY 2009 budget request also reflects a commitment to ensuring reliability by supporting research of breakthrough technologies such as those associated with a Smart Grid and Energy Storage. With $5 million dedicated solely to Smart Grid development, a $6.6 million dollar increase in the FY2009 request for Energy Storage, and more than $88 million dedicated to other R&D work, the President's FY2009 Budget Request reaffirms the effort to ensure increased reliability through R&D.

Modernizing the grid through technical innovation, however, represents just one side of the effort needed to tackle electricity reliability problems. Building the elaborate network of wires and other facilities needed to deliver energy to consumers reliably and safely is perhaps one of our greatest challenges today. This is especially true since renewable energy promises to become a substantial generation source. Since sources of renewable energy are often found in remote locations, we simply have to develop the capability to delivery it to load centers. Basically, if we want to use more renewable energy, we need more wires.

However, energy security and reliability will not be solved by focusing soley on expanding our modernization and expansion of our energy infrastructure. We also need to ensure energy delivery by keeping it secure and responding quickly when it is disrupted. DOE is the lead agency when Federal response is required for temporary disruptions in energy supply to ensure a reliable and secure electricity infrastructure for every American. We will use FY2009 funds to apply technical expertise to ensure the security, resiliency and survivability of key energy assets and critical energy infrastructure at home and abroad.

The reliability and energy security effort is both multifaceted and necessary, and the President's request reflects this.

RESEARCH AND DEVELOPMENT

Our High Temperature Superconductivity activities continue to support second generation wire development as well as research on dielectrics, cryogenics, and cable systems. This activity is being refocused to address a near-term critical need within the electric system to not only increase current carrying capacity, but also to relieve

overburdened cables elsewhere in the local grid. The superconductivity industry in the United States is now at the critical stage of moving from small business development to becoming a part of our manufacturing base.

Enhanced security for control systems is critical to the development of a reliable and resilient modern grid. The Visualization and Controls Research & Development activity focuses on improving our ability to measure and address the vulnerabilities of controls systems, detect cyber intrusion, implement protective measures and response strategies, and sustain cyber security improvements over time.

This activity is also developing the next generation system control and data acquisition (SCADA) system that features GPS-synchronized grid monitoring, secure data communications, custom visualization and operator cueing, and advanced control algorithms. Advanced visualization and control systems will allow operators to detect disturbances and take corrective action before problems cascade into widespread outages. The need to improve electric power control systems security is well-recognized by both the private and public sectors.

The Energy Storage and Power Electronics activities propose an increase of $6.6 million in FY 2009. This will support the development of new and improved energy storage devices and systems at utility scale, which will be incorporated in DOE's Basic Energy Science basic research results. We will also work to achieve substantial improvements in seeking lifetime, reliability, energy density, and cost of energy storage devices. Through this, highly leveraged prototype testing and utility demonstration projects will be expanded with state energy office participation focusing on areas of greatest utility need. The increase will also serve to focus on enhanced research in Power Electronics to improve material and device properties needed for transmission-level applications.

Large scale, megawatt-level electricity storage systems, or multiple, smaller distributed storage systems, could significantly reduce transmission system congestion, manage peak loads, make renewable electricity sources more dispatchable, and increase the reliability of the overall electric grid.

The Renewable and Distributed Systems Integration activities will allocate $5 million in FY 2009 to develop and demonstrate Smart Grid technologies for an integrated and intelligent electric transmission and distribution network. $28.3 million will be used to demonstrate distributed energy systems as a resource to decrease peak electric load demand, increase asset utilization, and defer electric system upgrades. These funds will also be used to develop renewable energy grid integration technologies to facilitate increased deployment of renewables and other clean energy sources.

PERMITTING, SITING, AND ANALYSIS

With hopes of creating a more robust transmission system, our FY 2009 budget request asks for $6.5 million for the Permitting, Siting and Analysis office. This is an $804 thousand increase from the FY 2008 budget request, and it will help to implement major electricity infrastructure provisions such as section 368 of EPACT and section 216(h) of the Federal Power Act. Further, work will be done to provide technical assistance to state electricity regulatory agencies and to electric utilities as they implement their energy efficiency initiatives.

In FY 2009, we will also be working to issue the second national transmission congestion study. In this process, we will be consulting with states and other interested parties on congestion metrics and data, and analyzing current historical congestion by region. Before the study is released, we will present draft conclusions of data analysis for public review and input.

The implementation of section 368 of EPACT requires the designation of rights-of-way corridors for the transport of oil, natural gas, hydrogen, and electricity on Federal lands in the eleven contiguous Western States. An interagency team, with DOE as the lead agency, conducted public scoping meetings concerning the designation of corridors in each of the eleven contiguous Western States. We have published a draft Programmatic Environmental Impact Statement for the designation of the energy transport corridors, solicited public comments, and conducted 15 public meetings, and the final PEIS is expected to be published in FY 2008. We are preparing to begin scoping for the designation of energy transport corridors in the Eastern States, Alaska, and Hawaii. The EIS for the remaining designations is expected before the end of FY 2009.

DOE is preparing regulations to implement its responsibilities under the new section 216(h) of the Federal Power Act to coordinate with eight other Federal agencies to prepare initial calendars, with milestones and deadlines for the Federal authorizations and related reviews required for the siting of transmission facilities. DOE will maintain a public website that will contain a complete record of Federal authorizations and related environmental reviews and will work closely with the lead Federal NEPA agency to encourage complete and expedited Federal reviews.

INFRASTRUCTURE SECURITY AND ENERGY RESTORATION

The President has designated the Department of Energy as the Lead Sector Specific Agency responsible for facilitating the protection of the Nation's critical energy infrastructure. The Office of Infrastructure Security and Energy Restoration (ISER) in the Operations and Analysis subprogram is responsible for coordinating and carrying out the Department's obligations to support the Department of Homeland Security in this important national initiative. The FY 2009 request is for $7.6 million in funding for Infrastructure Security and Energy Restoration within the Operations and Analysis subprogram, which is a $1.8 million increase from the FY 2008 request.

In FY 2009, ISER will work to identify system-wide vulnerabilities in power, fuels and other key energy sector assets and develop plans to secure and reconstitute those assets. We will help to develop tools and mitigation solutions to help energy sector owners and operators improve resiliency and implement best and effective practices, and provide solutions to state and local governments to address energy supply and infrastructure challenges. Further, we will continue to conduct vulnerability assessments of key domestic and selected foreign energy facilities in close collaboration with appropriate interagency and industry partners. And through the initialization of selected pilot projects, we will work to exercise the integration of regional, state and local energy resiliency and emergency response preparedness

We help to facilitate energy restoration efforts at the state and local level through cooperation and partnerships with local utility providers in support of the National Response Framework. In FY 2009, we will work to create detailed Concept of Operations Plans for energy response utilizing an Integrated Planning System

CONCLUSION

As you have heard, our work in OE is vital to our Nation's energy health and the increase in the President's request reflects this. Through our research and development of technologies such as power electronics, high temperature superconductivity, and energy storage, we will work to lower costs, increase efficiency, and also directly enhance the viability of clean energy resources by addressing issues such as intermittency, controllability, and environmental impact.

Federal investment in the research, development, and deployment of new technology combined with innovative policies and infrastructure investment, is essential to improving grid performance and ensuring our energy security, economic competitiveness, and environmental well-being.

This concludes my statement, Mr. Chairman. I look forward to answering any questions you and your colleagues may have.